

APPLICATION AND ASSEMBLY SUITED FOR USE  
AS A DISPOSABLE LEAK PROOF CHILD DRINKING CUP

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### **Related Application**

The present application claims priority from U.S. Provisional 60/421,818, filed October 28, 2002.

### **Field Of The Invention**

The present invention relates to covered beverage containers including single use plastic cups and lids that use a passive closure system to substantially prevent unintentional leakage of the liquid beverage. In another embodiment, the present invention relates to a method for preventing unintentional leakage of the liquid beverage from single use plastic cups and lids by using a passive closure system.

### **Background Of The Invention**

Typically, one method of attempting to prevent leakage of a liquid beverage from a disposable cup is to use containers in the form of a frusto-conically shaped cup having a planar bottom wall sealed to a tapered side wall adjacent a lower edge thereof, the side wall terminating at an upper end thereof in a rolled bead. A flexible synthetic resinous cover encloses the upper end and has a peripheral flange which engages the bead at the upper edge of the side wall. The cover often includes a slotted flexible area which is pierced by a conventional drinking straw to enable drinking of the contents of the cup without removing the cover. Straws are usually provided in a separate dispenser near the serving area. However, once the cover is pierced, such disposable cups do not substantially prevent unintentional leakage of the liquid beverage.

In another method of attempting to prevent leakage of a liquid beverage from a disposable cup is to use containers where the lid has at least two components for sealing the container to substantially prevent unintentional leakage of the liquid beverage. Examples of such systems are conventional "sport's bottles" with a two-piece closure lid system. This system is sometimes referred to as an "active" closure system because a slidable cap must be moved in one direction to open the closure and in the opposite direction to seal the closure.

### **Brief Description Of The Drawings**

The present invention will become more fully understood from the detailed

description given herein below and the accompanying drawings, which are given by way of illustration only, and thus, are not limitative of the present invention and wherein:  
FIG. 1 is a cross-sectional view of one embodiment showing the cup and integral lid;  
FIG. 2 is a cross-sectional view of a portion of the lid of FIG. 1;  
FIG. 3 is a top view of FIG. 1;  
FIG. 4 is a cross-sectional view of another embodiment showing the cup and integral lid;  
FIG. 5 is a cross-sectional view of a portion of the lid of FIG. 4;  
FIG. 6 is a top view of FIG. 4; and  
FIG. 7 is an embodiment showing a cross-sectional view of numerous cup and corresponding lid assemblies being stackable.

### **Detailed description Of The Embodiments**

Figures 1 through 7 showing examples of embodiments of the present invention. All size dimensions shown on the Figures are in millimeters, unless otherwise specified.

In one embodiment, the present invention is a disposable container assembly suited for use as a drinking cup with a passive closure system, the assembly comprises a container portion, a lid portion, and a hinge, which joins the container portion and the lid portion; the hinge is joined to a location on a sidewall of the container portion and is also joined to the lid portion; the lid portion is provided with a top surface, from which depends a skirt that extends around the perimeter of the top surface, the top surface is also provided with a drinking spout, which extends upward from the top surface; the drinking spout is provided at its upper end with at least one opening; the passive closure system consists of the opening in the lid that is sufficiently sized so that, when a liquid beverage is unintentionally positioned at the opening, the surface tension of the liquid beverage is sufficient so that the liquid beverage does not flow through the opening under normal conditions but when a person intentionally desires to drink from the container liquid beverage flows through the opening.

For purposes of the present invention, a "child" means a person who is below about the age of five.

In another embodiments, as illustrated by FIGS. 1 and 4, the present invention relates to a disposable container assembly suited for use as a child's drinking cup with a

passive closure system. The assembly 10 as shown in the figures is generally provided with a container portion 12, a lid portion 14, and a hinge 16, which joins the container portion and the lid portion. The container portion 12 has a base portion 18 at its bottom, from which sidewalls 20 depend upward, thereby defining a container suited for retaining a liquid beverage, such as milk, juice, or water, to name just three of many possibilities. The upper end 22 of the sidewall of the container portion is provided with a rim 24.

The hinge 16 is joined to a location on the sidewall that is near the upper end 22 of the sidewall. The hinge is also joined to the lid portion. The lid portion is provided with a top surface 26, from which depends a skirt 28 that extends around the perimeter of the top surface. As shown in the figures, the hinge is joined to the skirt. The top surface is provided with a drinking spout 30, which extends upward from the top surface. The drinking spout is provided at its upper end with at least one opening 32 through which the liquid can flow out of the container.

In one embodiment, as shown in FIG. 3, the passive closure system consists of an opening in the lid that is sufficiently sized so that, when a liquid beverage is unintentionally positioned at the opening, the surface tension of the liquid beverage is sufficient so that the liquid beverage does not flow through the opening under normal conditions (e.g. to substantially prevent unintentional leakage of the liquid beverage) – referred herein as a “passive closure” system. However, when a person intentionally desires to drink from the container and thus alter those conditions, for example, by creating a vacuum at the opening, surface tension is overcome, and liquid beverage flows through the opening. Thus, in contrast to an active closure system, the present invention involves no physical manipulation of the closure mechanism for either opening or closing the closure.

In yet another embodiment, as shown in FIG. 6, the passive closure system consists of a plurality of openings, with each opening sufficiently sized as described above. This arrangement will increase the volume of liquid that can flow through the openings with each sip, while still obtaining the benefit of a substantially leak-proof opening.

In yet another embodiment, as shown in FIGS. 2 and 5, the opening or openings may be positioned in a recess 34 in the drinking spout.

In yet a further embodiment concerning the lid portion, near the location where the top portion is joined to the skirt, the interior of the skirt is provided with a downwardly depending tab 38 that extends around the bottom side 40 of the top surface of the lid portion. Also, the skirt is provided with a recess 42 provided on the interior side of the skirt. When the lid portion is closed upon the container portion, the rim 24 of the container portion is sealingly engaged between the downwardly depending tab on the top surface, and the recess in the skirt. With this arrangement, the assembly is sealed, preventing liquid in the assembly from leaking through the junction between the sidewalls of the container portion, the top surface of the lid portion, and the skirt of the lid portion.

In another embodiment, the lid portion is further provided with a latch 44 , hingedly attached to the skirt, which fits around peg or pegs 46 provided on the sidewall of the container portion. This provides an arrangement for locking the lid portion onto the container portion.

As shown in the FIG. 7, in one embodiment, the assemblies may be stackable. The assemblies of the present invention can be molded of a suitable plastic material, relatively cheap in cost, so that the assemblies may be regarded as disposable after use.

In yet another embodiment, the disposable container may be configured to have a dual wall construction so as to increase the insulating ability of the container. Such dual wall constructions and methods of making such constructions are disclosed in U.S. Serial No. 09/865,792, which disclosure is incorporated by reference herein.

In another embodiment, the container portion 12, lid portion 14, and hinge 16 may be produced in a conventional molding process and, in still another embodiment, may be molded in accordance with the mold similar to that disclosed in U.S. Patent Nos. 4,783,056 and 4,812,116 respectively. In a further embodiment, with such a process and mold, the assembly, including the lid, container, and hinge may be produced in accordance (but not limited to) with the operation disclosed in U.S. Patent Nos. 4,783,056 and 4,812,116 or, in another embodiment, may be produced in accordance with U.S. Patent No. 5,723,085 or 6,303,064. The disclosure of these patents are incorporated by reference herein.

The teachings of the following patents and patent applications are incorporated herein by reference for examples of seals and hinges (although these are merely illustrative examples and not limiting): U.S. Patent Application Serial No. 09/386,702; U.S. Patent nos. 4,812,116, 4,807,425 and 5,723,085, 6,303,064, and European patent document no. EP 625 948.

In another embodiment, the disposable containers of the present invention may be commercially sold with or without a liquid beverage. For example, the disposable containers of the present invention may be pre-filled with a liquid beverage (e.g. spring water or treated water) and sold as a disposable "water bottle." In yet another embodiment, the lid may contain a tamper-evident seal at the point of sale of the pre-filled container assembly.